

STATEMENT OF WORK
CLEANING 4670 LOX STORAGE AREA TANKS
AND ASSOCIATED PIPING

August 19, 2008

A. SCOPE

The statement of work outlines the requirements for chemically cleaning the three 26,500 gallon stainless steel liquid oxygen (LOX) tanks and associated transfer and vent line piping located at Test Stand 4670, LOX Storage Area, MSFC, AL.

B. REQUIREMENTS

The subject tanks and piping described in Section D Item 1 and Section D Item 2 Segments 1 and 2 shall be cleaned in accordance with MSFC-SPEC-164B CLASS IIIA for LOX service. The piping described in Section D Item 2 Segment 3 shall be cleaned in accordance with MSFC-SPEC-164B CLASS V. MSFC Quality shall be notified by the Contractor when any sampling is to be performed. MSFC Quality will monitor all cleaning operations and will inspect and sample as necessary to make final acceptance of work. Upon completion of work verification of cleanliness will be performed per Section 3.3 of MSFC-SPEC-164B.

The Contractor shall provide all labor and materials to clean the three 26,500 gallon LOX tanks and associated piping as well as all hardware (flanges, fittings, hoses, etc.) required during the cleaning process.

The Contractor is responsible for verification of actual pipe lengths and physical locations described in Section D.

The Contractor shall be responsible for obtaining all necessary permits and licenses, and for complying with all applicable federal, state, and municipal laws.

The Contractor shall be responsible for compliance with all OSHA and MSFC requirements during the performance of this statement of work.

Two copies of the Material Safety Data Sheets (MSDS) for chemicals that may be used during this work shall be provided to the MSFC Safety Office for review prior to any work activities beginning.

If required site visits may be arranged by contacting the procurement officer.

C. GOVERNMENT FURNISHED EQUIPMENT (GFE)

1. Purge and Drying Gasses – Gaseous Nitrogen and Missile Grade Air will be provided by the Government in adequate pressure and volume. See Section E Item 1.
2. Waste Disposal Site – A waste disposal site is provided by the Government and is available for the Contractor's use.
3. Handling Equipment – If necessary, heavy lift equipment (cranes, forklifts, etc.) operated by MSFC personnel or their Contractors, will be provided for on-site operations.

D. OPERATIONS

The three 26,500 gallon LOX tanks and piping at 4670 described in Item 1 and Item 2 Segments 1 and 2 shall be cleaned to MSFC-SPEC-164B CLASS IIIA requirements. The piping at 4670 described in Item 2 Segment 3 shall be cleaned to MSFC-SPEC-164B CLASS V requirements.

1. Three 26,500 gallon stainless steel LOX tanks (T1, T2, T3)
2. The associated piping sections are as followed:

SEGMENT 1

- Front 8" vacuum jacketed transfer line. This line is composed of two pieces with both having sections of welded pipe connecting each piece to its respected transfer ROV and unloading stations.

The front left section includes one flexhose connection and one unloading station hookup. Approximate length 27'.

- The front right section includes two flexhose connections and one unloading station hookup. Approximate length 24'.

Total Approximate Length: 51'

SEGMENT 2

- 6" transfer line located near the LOX pumping stations starting downstream of F-1054 continuing to the base of stand 4670. Approximate length 133'.
- Branch piping connecting from the 6" transfer line to valve HOV-1065. Approximate length 10'.
- 3" piping running back up from the 6" transfer line to a capped 3" flange connection. Approximate length 30'
- 6" transfer line continuing from the base of the stand to valve ROV-1057 located on Level 10. Approximate length 100'.
Note: ROV-1057 will be removed and end connection capped prior to cleaning.

Total Approximate Length: 273'

SEGMENT 3

- 6" vent line from the LOX Dump Area to the pipe spool located on Level 12. Approximate length 500'.
- Vent piping spool connecting from the 6" vent line to FH-10977 and FH-10978 for pumps P10010 and P10020. Approximate length 10'.
- Vent piping spool connecting the 6" vent line to the side transfer lines. Approximate length 10'.
- Discharge piping from valve ROV-1020 north to the flexhose at the LOX Dump Area. Approximate length 58'

Total Approximate Length: 578'

3. Valves and other components will be serviced and cleaned by the Government.
4. The Contractor is responsible for the removal, cleaning and reinstallation of all flanges and pipe spools associated with the tanks and piping outlined in Section D Items 1 and 2. MSFC will supply to the Contractor for installation all required flange gaskets that have been cleaned and batch tested in accordance with MSFC-SPEC-164B. MSFC will supply to the Contractor for installation the required cleaned end connections on Levels 10 and 12 called out in Section D Item 2 Segments 2 and 3 for final closure.
5. After the piping described in Section D Item 2 Segment 1 has been cleaned the Contractor shall have the ends taped and wrapped in an approved covering and secured with tape that meet the requirements outlined in section 3.5 of MSFC-SPEC-164B.

E. SUBMITTAL

1. The Contractor shall submit in writing the following with the response to this SOW:
 - Procedures for chemically cleaning stainless steel piping shall be submitted in accordance with Section 3.2.1 of MSFC-SPEC-164B.
 - Volume and pressure requirements for purge and drying gas requirements in SCFM and PSIG.
2. Cleaning results will be submitted for all items cleaned.
3. At the discretion of the Government the piping outlined in Section D Item 2 Segment 3 may be omitted. Therefore, the Contractor shall distinguish in the submitted quotation the additional cost to clean the Segment.

4. Prior to authorization to proceed all written procedures shall be approved by the Government.
5. Contractor shall submit in writing qualifications to perform work which will be reviewed and approved through MSFC Quality.

F. REFERENCES

1. MSFC-SPEC-164B, Cleanliness of Components for use in Oxygen, Fuel, and Pneumatic Systems
2. Drawing 90M09265, LOX Storage Facility Building 4670
3. Drawing 90M08327, Liquid Oxygen System